# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/821,827 | 04/09/2004 | Robert Denk | 068758.0185 | 1400 |

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| EXAMINER |
|---|
| WONG, LINDA |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2611 | |

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| 04/30/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| | Application No. | Applicant(s) |
| | 10/821,827 | DENK, ROBERT |
| **Office Action Summary** | Examiner | Art Unit | |
| | Linda Wong | 2611 | |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>09 April 2004</u>.

2a)☐ This action is **FINAL**.    2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1-12</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-12</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>09 April 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

## DETAILED ACTION

### *Priority*

1.    Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d),

which papers have been placed of record in the file.

### *Information Disclosure Statement*

2.    The information disclosure statement (IDS) was submitted on 4/9/2004. The '

information disclosure statement has been considered by the examiner.

### *Drawings*

3.    The drawings were received on 4/9/2004. These drawings are accepted.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4.    **Claims 1-3,5-6,9-11** are rejected under 35 U.S.C. 102(e) as being

anticipated by Bonhomme (US Patent No.: 6954618).

   a.    **Claims 1,5,9,**

i.   Bonhomme discloses

- "determining a sequence of unfiltered channel estimation values"
  (Col. 2, lines 3-7 discloses determining part of the channel
  estimation based on complex coefficients, Col. 8, lines 41-45
  discloses determining first estimation values of the fading
  coefficients in the sense of maximum likelihood, Col. 6, lines 18-
  22 discloses the determining "the fading coefficients associated
  with different paths, that is, it will perform a channel estimation",
  wherein first estimation values of the fading coefficients are
  inputted in the filter as shown in Fig. 3, labels 30 and 35)

- "selecting a specific set of filter coefficients from two or more
  filter coefficient sets, with the filter coefficients being calculated
  on the basis of the MMSE optimality criterion for a predetermined
  recursive digital filter" (Col. 2, lines 53-60 discloses determining
  sets of coefficients using MMSE, lines 63-67 discloses "selection
  of a set of precalculated Wiener filter coefficients", Fig. 1 shows
  filtering (label rr) is within a recursive or loop system that
  continuously filters)

- "filtering of the sequence of unfiltered channel estimation values
  by means of the recursive digital filter using the selected filter
  coefficients in order to calculate the filtered channel estimation
  values" (Fig. 3, label 35 shows a filter, label 34 shows the
  selected coefficients, label 31 shows the precalculated

coefficients, and Col. 6, lines 18-22 discloses determining

channel estimation by determining coefficients associated with

different paths.)

b.  **Claims 2,6,10**, Bonhomme discloses "the specific set of filter coefficients

is selected as a function of the relative speed between the transmitter

and the receiver and of the signal-to-interference and noise ratio". (Fig.

3, labels 32,33 and 34 and Col. 8, lines 10-18)

c.  **Claims 3,11**,

i.   Bonhomme discloses

- "sets of filter coefficients are calculated for different relative

  speeds between the transmitter and the receiver and for any

  desired signal-to-interference and noise ratio" (Fig. 3, labels

  32,33 and 34, Col. 3, lines 26-29 discloses the power of the

  signal is signal/noise ratio, Col. 8, lines 10-18 discloses sets of

  coefficients are determined based on the speed)

- "the selection and filter steps comprises the steps of: selecting a

  specific set of filter coefficients as a function of the relative speed

  between the transmitter and the receiver" (Fig. 3, label 32,33,34)

  "filtering of sequences of unfiltered channel estimation values

  which are associated with different transmission paths, using the

  filter coefficients of the same selected specific set." (Fig. 3, label

  35 and 34)

## *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5.  **Claims 4,12** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Bonhomme as applied to claim 1 in view of Tsatsanis (US Patent No.:

6445692).

a.  **Claims 4,12,**

   i.   Bonhomme fails to disclose "the filter coefficients of said sets are

        calculated by averaging over various values of the signal-to-

        interference and noise ratio in the MMSE optimization process".

   ii.  Tsatsanis discloses such a limitation. (Col. 15, lines 15-32 discloses

        averaging the Signal to Interference and Noise (SINR) over various

        iterations with trained MMSE receiver.) It would have been obvious

        to one skilled in the art at the time of the invention to incorporate

        determining the power or SINR as disclosed by Tsatsanis into

        Bonhomme so to effectively determine the SINR so to optimize the

        filter parameters.

6.  **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over

Bonhomme as applied to claim 5 in view of Jayaraman et al (US Patent No.:

6901243).

a.  **Claim 7,**

    i.  Bonhomme discloses

        •  "two or more sets of filter coefficients, with each set being

            calculated for a specific relative speed between the transmitter

            and the receiver and for any given signal-to-interference and

            noise ratio" (Fig. 3, labels 32,33 and 34, Col. 3, lines 26-29

            discloses the power of the signal is signal/noise ratio, Col. 8,

            lines 10-18 discloses sets of coefficients are determined based

            on the speed)

        •  "the means for selection of a specific set of filter coefficients is

            designed to make the selection as a function of the relative

            speed between the transmitter and the receiver" (Fig. 3, labels

            32,33 and 34, Col. 3, lines 26-29 discloses the power of the

            signal is signal/noise ratio)

    ii.  Bonhomme fails to disclose

        •  "two or more digital filters are provided for filtering sequences of

            unfiltered channel estimation values which are each associated

            with different transmission paths, and the filters are configured

            using the same filter coefficients from the selected set".

iii.    Jayaraman et al discloses such a limitation. (Fig. 2, label 240, Col. 4, lines 35-40 discloses the selectable filter can be implemented with a bank of filters and the adaptive filter may be adjusted by adapting the filter coefficients) It would have been obvious to one skilled in the art at the time of the invention to incorporate a bank of filters receiving the same filter coefficients as disclosed by Jayaraman et al into Bonhomme's invention so to detect and mitigate channel interference. (Col. 2, lines 15-20)

7.   **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bonhomme in view of Jayaraman et al as applied to claim 7, further in view of Tsatsanis (US Patent No.: 6445692).

    a.  **Claim 8**,

        i.    Bonhomme fails to disclose "the filter coefficients of said sets are calculated by averaging over various values of the signal-to-interference and noise ratio in the MMSE optimization process".

        ii.    Tsatsanis discloses such a limitation. (Col. 15, lines 15-32 discloses averaging the Signal to Interference and Noise (SINR) over various iterations with trained MMSE receiver.) It would have been obvious to one skilled in the art at the time of the invention to incorporate determining the power or SINR as disclosed by Tsatsanis into Bonhomme in view of Jayaraman et al's invention so to effectively determine the SINR so to optimize the filter parameters.

## *Conclusion*

8.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.
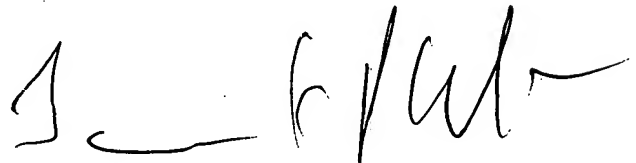
   a.   Yang et al (US Patent No.: 6954509)

   b.   Smee et al (US Patent No.: 6983125).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linda Wong whose telephone number is 571-272-6044. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Linda Wong
4/25/2007

**JAY K. PATEL**
**SUPERVISORY PATENT EXAMINER**